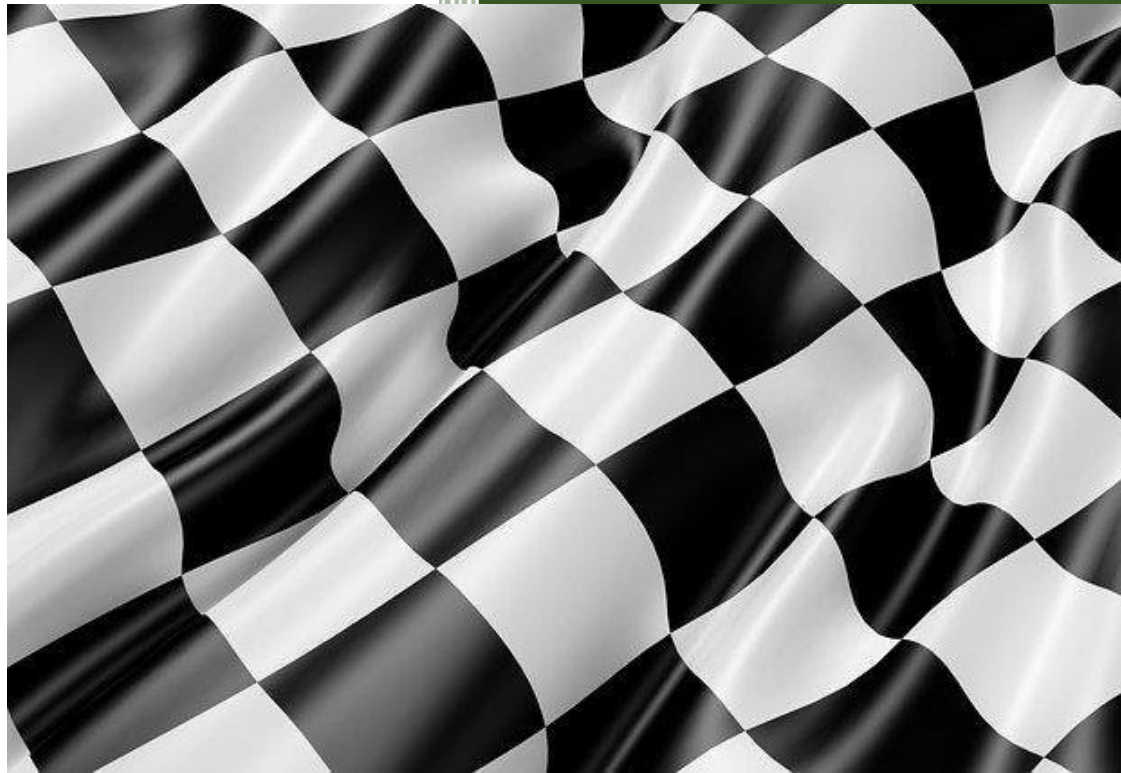




2024

MSA National ROK Karting Technical Regulations



Version 3

1 February 2024

163098

REVIEW AND AMENDMENTS

Amendments and updates to the rules will be recorded in the Amendment Record, detailing the amendments, date applicable and a short summary of amendments.

AMENDMENT RECORD

<i>Modified SSR / ART</i>	<i>Date applicable</i>	<i>Date of Publication</i>	<i>Clarifications</i>
ART 2 d	01.02.2024	01.02.2024	Regulation amendment
ART 2 e	01.02.2024	01.02.2024	Regulation amendment
ART 19	01.02.2024	01.02.2024	Regulation amendment
ART 27 b	01.02.2024	01.02.2024	Regulation amendment
ART 15 c	22.01.2024	22.01.2024	Regulation added
ART 17 Specification Sheet	22.01.2024	22.01.2024	Regulation Amendment
ART 19 Specification Sheet	22.01.2024	22.01.2024	Regulation Amendment

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SECTION A – GENERAL REGULATIONS ALL CLASSES

1. ADMINISTRATION

- a. Karting is administered under the provisions of the General Competition Rules of Motorsport SA (GCR's), these Standing Supplementary Regulations (SSR's), the class specific Regulations and other regulations and instructions which may from time to time be issued by Motorsport SA (hereinafter referred to as MSA) and the Supplementary Regulations published for each particular kart competition.
- b. These Technical Regulations may generally only be amended for safety reasons or because of force majeure.
- c. It must be noted that MSA Regional and Club Karting regulations may not be in conflict with these MSA National Karting Regulations, unless approval to the contrary has been provided by the Karting Management Group in writing. Where individual Regional and Club Karting regulations are silent on an issue, and in the event of any dispute, these National SSR's will take precedence.

2. FUEL, OIL AND RADIATORS

- a. Where the SR's for an event specify the fuel to be used:
- b. The name of the filling station and pump number will be the only permissible fuel for the event in question.
- c. The organizers have the right to undertake fuel testing by using a FT64 Digitron fuel meter.
- d. ~~The only the specified brand of oil permitted is ENI engine oil and at the specified ratios are may be used and this may not be tampered with in any way.~~
 - Kid Rok, Mini Rok, OKJ and OKN – 5% (20:1)
 - KZ2 4% (25:1)
- e. ~~The national promotor will nominate the fuel/oils prior to each SA National Championship event. These will be the only fuel/oils permitted for the event. The fuel/oils so nominated and appearing in the SR's will be used. Also refer to article 12 Fuel Testing.~~
- f. Apart from the Cadet class, overflow bottles are mandatory for fuel tanks and radiators (if applicable).
- g. Any receptacle containing fuel flowing to the engine. The fuel tank must be securely fixed to the chassis and designed in such a way that neither the tank nor the pipes (that must be flexible) present any danger of leakage during the competition. A quick attachment to the chassis is strongly recommended. The fuel tank must in no way be shaped to act as an aerodynamic device. It must supply the engine only under normal atmospheric pressure. This means that, apart from the fuel pump located between the fuel tank and the carburettor, any system (mechanical or not) that may have an influence on the internal pressure of the fuel tank is not allowed. It is mandatory to place the fuel tank between the main tubes of the chassis frame, ahead of the seat and behind the rotation axis of the front wheels.

3. DEFINITIONS AND GENERAL REGULATIONS

- a. Chassis – Complete kart as supplied from the registered importer excluding the engine.
- b. Engine – Complete power unit as supplied by the importer including exhaust, carburetor, air box, battery, battery box and wiring harness (as applicable).

- c. Only sealed, leakproof, maintenance-free batteries are allowed. The user instructions prescribed by the manufacturer must be respected. The presence of «CE» and markings on lithium batteries must be checked.
- d. It is mandatory to have a floor tray made of rigid material stretching from the central strut to the front of the chassis frame. It must be laterally edged by a tube or a rim preventing the driver's feet from sliding off the floor tray. The floor tray may be perforated, but the holes must not have a diameter of more than 10 mm and they must be separated by four times their diameter as a minimum. In addition, one hole with a maximum diameter of 35 mm is allowed for steering column access. The floor tray may be made of composite material.
- e. An efficient rear brake disc protective pad (in nylon, carbon fibre, Teflon, Kevlar, Delrin or equivalent hard plastic) is mandatory in Groups 1, 2 (Senior Karts) & 3 (Junior Karts) if the brake disc protrudes below or is level with the main chassis frame tubes nearest to the ground. This protection must be placed laterally in relation to the disc, in the longitudinal axis of the chassis or under the disc.
- f. The rear brake disk and calliper may be cooled with a professionally made brake cooling tube. It must be securely attached, not reach further than the seat and not extend under the chassis

4. TYRES / WHEELS

- a. The use of wet weather tyres in qualifying or any of the races will not be permitted unless a wet race or practice is declared by the Clerk of the Course. Likewise, the Clerk of the Course can withdraw authorization for wet weather tyres.
- b. The only tyre allowed are the Levanto tyres. The Tillotson Cadet class will utilize Maxxis tyres.
- c. One (1) set Dry and/or Wet tyres are permitted from the start of Timed Qualifying Practice.
- d. Only tyres issued by the Promoter/Importer will be permitted for the race.
- e. All Drivers must start qualifying practice on new tyres except if it's declared as wet or where the class specific regulations or event SR's permit otherwise.
- f. The organisers must arrange for each competitor's tyres to be marked with his/her racing number and class when exiting the circuit after qualifying, where a barcode scanning system is not in place. The marked (scanned) tyres and/or rims may be impounded by the organisers and re-issued on the day of the race if originally issued prior to race day.
- g. Both dry & wet weather tyres must be identified prior to being used. Checks on identified tyres may be made at any time throughout an event and any competitor found using any tyre, which has not been identified for the event will be excluded from the prior races or qualifying races. Exchanging of tyres between competitors is forbidden and the penalty will be the same as above. The only rain tyre which may be used are Bridgestone's.
- h. It is prohibited to use any chemical treatment, or other means, to artificially enhance the performance of tyres used during official practice or racing. The organisers reserve the right to replace one or more of any competitor's tyres, with a substitute tyre of similar wear, should they believe such action to be warranted. Should a tyre be worn to the extent that it is no longer safe for use, the Clerk of the Course in consultation with the TC may require such a competitor to withdraw from further participation in the event so affected.
- i. The only substance that may be used to inflate tyres is normal air (compressed or otherwise). Race organisers shall have the right to require competitors to deflate their tyres on request and re-inflate them under supervision using normal air. The use of any tyre inflation substance

other than normal air and/or the failure to respond to a request to deflate/re-inflate tyres as above shall be deemed a contravention of the technical regulations and shall be dealt with accordingly.

- j. Tyres may not be deflated after the completion of qualifying or race until the kart has left Parc Ferme. The use of any sort of any artificial heating device to pre-heat tyres, or tyre treatment, including the use of heat guns is strictly forbidden for removal of excess rubber. For the Cadet class, the use of heat guns for removal of excess rubber is allowed. The organizers reserve the right to replace one or more of any competitor's tyres, with a substitute tyre, should they believe such action to be warranted, with the consent and agreement of the Technical Consultant.
- k. A wheel consists of a rim that is fitted with a pneumatic tyre, with or without an inner tube. «Set of wheels» means two front and two rear wheels. Only the tyres may come into contact with the ground when the driver is sitting in the kart. Any system or valve to adjust, limit or monitor the tyre pressure when the wheel is in use is not allowed. Only tyres of the same make and type are allowed at any one time. The attachment of the wheels to the hubs and axles must be done via M8 self-locking nuts and bolts. Maximum pressure for assembly: 4 bar

l. Wheel dimensions

<u>Groups 1 & 2 (Senior Karts) : 5-inch wheel</u>	Front	Rear
Maximum outer diameter	280 mm	300 mm
Maximum width	135 mm	215 mm
<u>Group 3 (Junior Karts) : 5-inch wheel</u>	Front	Rear
Maximum outer diameter	260 mm	290 mm
Maximum width	120 mm	150 mm

The above figures are maximum wheel dimensions, with a matching tyre fitted on the rim and an air pressure of 1 bar.

m. Tyres allowed per class:

Class	Slick	Wet
Tillotson Cadet	Maxxis (10x4.00-5) (11x5.00-5)	Bridgestone YPW
Kid ROK	LeVanto KRT MINI	Bridgestone YPW
Mini ROK	LeVanto KRT MINI	Bridgestone YPW
OKJ/ OK-N	LeVanto KRT	Bridgestone YNP
KZ2	LeVanto KRT	Bridgestone YNP

5. MINIMUM CLASS WEIGHTS PERMITTED

Tillotson Cadet	74kg		Kid Rok	100kg
Mini Rok	110kg		OKJ	145kg
KZ2	180kg		OK-N	155kg

6. AXLES, RIMS, REAR TRACK

The rear axle as well as the rims used on the chassis do not have to come from the same manufacturer as the chassis itself. The minimum axle wall thickness applies except where keys are fitted. The maximum diameter of rims shall not exceed 5 inches (126mm). Apart from the KZ class

(refer this section), the maximum rear width is measured to the outer-most face of the rims or tyres, whichever is the greater. In Groups 1, 2 (Senior Karts) & 3 (Junior Karts), only 5-inch rims complying with TD n° 1.1 are allowed. Coupling diameter of the tyre for the rim: 126.2 mm with a +0/-1 mm tolerance for the diameter. Width of tyre housing: min. 10 mm. External diameter for 5-inch rims: 136.2 mm minimum. Radius to facilitate the balance of the tyre in its housing: 8 mm.

The following is applicable to the various classes:

Parameter	Tillotson Cadet	Kid/MiniRok	OKJ/OK-N	KZ2
Axle OD	30mm	30mm MAX	50mm MAX	50mm MAX
Axle wall	N/A	4.9mm MIN	2.0mm MIN	2.0mm MIN
Axle length	N/A	960 ± 10mm	N/A	N/A
Axle mass	N/A	2900 ± 100g	N/A	N/A
Front rim width	11.5cm MAX	11.5cm MAX	13.5cm MAX	
Rear rim width	13.0cm MIN 15.0cm MAX	13.0cm MIN 15.0cm MAX	21.5cm MAX	
Rear track	N/A	1100mm MAX	1400mm MAX	1400mm MAX

Rear axle

The rear axle diameter must comply with the category in which the kart is entered. In all categories, the rear axle must be made of magnetic steel.

Each rear axle must have, on the inside and outside, a rounded edge or a chamfer with a maximum diameter corresponding to the axle thickness. The chamfer must not have sharp edges.

The rear axle used on the chassis does not need to come from the same manufacturer as the chassis itself.

The axle wall thickness depends on the outside diameter of the axle. It must comply with the following criteria at all points (except the keyways):

Max. external diameter (mm)	Min. wall thickness (mm)
50	1.9
30	4.9
28	full

7. SEATS & SUPPORTS

The kart seat must be rigidly located on the chassis. It must be so designed so that the driver is securely located to resist movement when cornering or braking. It must be secure, provide the driver with adequate protection and not be cracked or damaged in such a way as to pinch or lacerate or endanger a driver in any way. Seats supports MUST be mounted by using nuts, bolts, and a metal or aluminum washer with a minimum diameter of 40mm and 1,5mm thickness to eliminate break through. The lower seat bolts may be loosened in the event of rain.

All seat supports and stays must be bolted or welded at each end. If they are not used, these seat supports and stays must be removed from the chassis frame and seat.

The driver's seat must be designed to prevent him from moving towards the sides or front when cornering or braking. It may be made of composite material. Hight seats according to FIA standard 8873-2018 are strongly recommended for Group 3 (Junior Karts).

7.1 Reinforcement plates

Reinforcement plates are required to support the upper part of the seat. They must have a

minimum thickness of 1.5 mm, a minimum surface of 13 cm² and a minimum diameter of 40 mm.

7.2 Seat stays

All seat stays must be bolted at each end. If they are not used, these seat stays must be removed from the chassis frame and seat.

8. CHAIN GUARD

A chain guard is compulsory in all classes and must be an effective protection over the top and both sides of the exposed chain and sprocket and extend at least to the lower plane of the rear axle down a line at least level with the center of both front and rear sprockets. Where engines are fitted with side-mounted carburetors adjoining the front sprocket, a guard must be fitted to prevent the driver's fingers becoming entrapped in the chain.

If a complete chain guard covering the chain and sprockets is used, the chain guard homologated with the engine may be dismantled. In gearbox classes, the chain guard must cover the sprocket and the crown wheel down to the center of the crown wheel axis.

Cadet competitors may use the chain guard and supports provided by the OEM, but it is recommended that the cover be lowered to fully cover the sides of the top of the chain.

Chain guards may be made of composite material. In direct drive classes, the chain guard must provide an effective protection over the top and on both sides of the exposed chain and sprockets, and extend at least to the lower plane passing to the rear axle.

9. PEDALS

With the exception of the Cadet class, the brake pedal **MUST** have a double linkage to the master cylinder. The accelerator pedal **MUST** be equipped with a return spring, and pedal extenders and footrest are allowed.

9.1 Pedals/pedal kits

Whatever their position, pedals must never protrude in front of the chassis, including the bumper. The brake pedal must be placed in front of the master cylinder. The accelerator pedal must be equipped with a return spring. A mechanical link between the accelerator pedal and the carburettor is mandatory. Pedal kits to relocate the driver's feet may only be used if supplied by the chassis manufacturer.

9.2 Brake control

The brake control, i.e. the link between the pedal and the pump(s), must be doubled for safety and always be in conformity with the HF. If a cable is homologated, it must have a minimum diameter of 1.8 mm.

10. MASS

The mass shall mean, the minimum mass permitted at all times, including during qualifying, and will include the mass of the driver equipped for racing with helmet, visor or goggles, shoes, gloves and protective clothing. Any ballast carried in order to meet the minimum mass prescribed must

be firmly fixed to the satisfaction of the scrutineers only to the chassis or seat. For any ballast weight of up to 2kg, attachment must be by a minimum of one bolt with a minimum size of M6 or permanent fixings, with an additional bolt or fixing for every 4kg or part thereof. Cable ties are NOT allowed.

10.1 Ballast

The mass of a kart may be adjusted with one or more solid blocks attached to the chassis frame, to a chassis auxiliary part (except bumpers) or the seat.

Maximum mass of a single ballast: 5 kg. Combined ballasts on the same attachment count as a single ballast.

Ballast must be attached by means of tools with at least two bolts:

0-2.5 kg of a minimum diameter of 6 mm, >2.5-5 kg of a minimum diameter of 8 mm.

If the ballast is attached to a chassis auxiliary part, all bolts linking the auxiliary part to the chassis frame must be of the same minimum diameter as that used to attach the ballast itself.

Reinforcement plates are mandatory for the attachment of the ballast to the seat. These plates must have a minimum thickness of 1 mm and a minimum diameter of 20 mm

11. CHASSIS

The only chassis permitted are as per MSA Karting Sporting Regulations. Chassis is to be raced as supplied by the OEM.

For the Cadet class, only the Tillitson T-CHS-BB1 chassis is eligible.

12. FUEL TESTING

- a. The following test method will apply to all karting events and classes as approved by MSA for Club, Regional and National events.
- b. The test instrument will be the Digatron FT64 which must be clearly identified by a serial number or identifying mark and will be the only instrument of the day to be used. Only MSA approved Fuel TC's may perform fuel testing.
- c. The only calibration on the instrument of the day will be the reading from the mixed reference sample fuel that is kept by the fuel TC.
- d. A clearly marked reference sample of every mix ratio (fuel: oil) will be kept by the fuel TC or COC.
- e. The difference in reading between the reference sample that is applicable for each class and competitor fuel reading may not be more or less than 2. This value may be changed by the Fuel TC of the event before qualifying. Fuel testing can be done at any time during the event.
- f. The temperature difference may not be more than 2 degrees Fahrenheit. If the temperature is not within the limits, the fuel tank of the competitor must be impounded and sealed, the competitor's fuel temperature will be allowed to equalize to the reference sample and a new reading obtained no later than 30 minutes before publication of final results.
- g. The minimum amount of fuel in the tank at any time may not be less than 300ml. The fuel may be decanted into a suitable container for the necessary testing to be done.
- h. It is the responsibility of the competitor to be present at all times when readings of the fuel are done and to check with the fuel TC that the fuel used by competitor is within the set parameters.
- i. The COC or Fuel TC may at any time have competitor's fuel replaced with organiser's fuel.

- j. A penalty of exclusion will apply for any infringements of the above and repeat offenders will have their race licence revoked.

13. TITANIUM

The use of titanium for any part of a kart is forbidden.

14. BODYWORK – GENERAL

- a. Nose cones may NOT have additional fastenings or securing for example, plastic zip ties, other than as stated below. In the interest of safety, it is permitted to secure the nose cone clamps with a single loose cable tie as pictured below to the upper bumper bar.



- b. In the event of loss of the front fairing (nose cone) during a race, the competitor must pit within (2) laps to have the fairing replaced. Failure to do so will result in the exclusion.
- c. The bodywork must be homologated by the CIK-FIA together with the accompanying bumpers and attachments. Combining homologated bodywork elements is allowed. However, the two side pods must be used together as a set.

15. IMPOUNDED PARTS AND SUBSTITUTION OF PARTS

- a. From qualifying each driver will be allowed to use a maximum of two sealed engines. Should a competitor subsequently wish to change or repair an engine or component thereof, which will necessitate the breaking of a seal or removing any identification, this may only be done under the supervision of the Scrutineers. Once the change of engine or component is complete, the engine or component will again be sealed or identified. The changed component or engine must be impounded by the Scrutineers.
- b. When a competitor elects to use his/her second engine during competition the first engine used must be handed in at Parc Ferme to the Technical Consultant/Scrutineer prior to the start of the competitor's next race.
- c. The TC in consultation with the COC, shall have the right to inspect any engine or any part of any engine at any time during an event without providing any reason for that inspection. The TC and/or the organiser shall have the right to require, at any time during an event and without any reason, to have a competitor exchange any part or component of the engine (including, but not limited to, the clutch, exhaust, carburettor, coil, wiring loom, ignition, fuel) with an identical part to be provided free of charge to the competitor by the organisers and/or the promoter of the event."

Note: Engines handed in to the Technical Consultant/Scrutineer will be subject to technical checks.

SECTION B – KID ROK & MINI ROK

16. ENGINE

- a. The only engines permitted is as per the homologated engines listed in the National Karting Sporting Regulations.

- b. All engines must be sealed by the Engine Builder, Technical Consultant and/or Scrutineer. It is the responsibility of the competitor to ensure that the Engine Builder, Technical Consultant/Scrutineer has sealed his/her engine/s before taking part in qualifying/races. ALL competitors need to ensure that the cylinder head and cylinder have cross-drilled nuts/bolts to facilitate the fitting of wire seals. Seals need to have a barcode and number.
- c. No type or form of modifications is allowed to the engine or any other parts except those detailed in the engine specification sheet. This includes fuel supply, carburetor, ignition, etc.
- d. No break is allowed in fuel line between tank to fuel pump except for the fitting of a fuel filter.
- e. A fuel return pipe may be fitted on the pump side of the fuel line between the pump and the carburetor fuel inlet.
- f. The following fuel return specification will apply only to Kid Rok:

Kid Rok fuel line return specifications – To be used as supplied by Derrick Irving Racing	
Fuel line, carb to bottom of T-piece	4.8mm ID. Length less than 50mm.
Fuel line T-piece side to fuel pump supply	4.8mm ID. Length 310mm ± 20 mm. ID Needs to be marked on pipe.
Fuel line T-piece to return filter	6mm ID. Length 800mm ± 50 mm. ID Needs to be marked on pipe.
Fuel line return to fuel tank	6mm ID. Length 450mm ± 50mm. ID Needs to be marked on pipe.
T-piece	6mm Festo blue/brass.
Fuel filter - OMG. Re-usable with spec jet	Return jet is optional.

- g. No exhaust or cylinder temperature measuring devices or lambda sensors are allowed to be used during qualifying/races. To clarify, these devices and/or sensor must be completely removed and the exhaust must be used as supplied by the engine importer.
- h. Competitors must ensure that clutches and clutch drums are free from oil, grease or any other lubricants.
- i. Refer to the relevant engine and carburetor specification sheets for technical specifications and carburation, which can be found on the MSA website www.motorsport.co.za
- j. The wiring harness is free of restriction.
- k. The engine kill switch is not mandatory.

17. KID ROK & MINI ROK ENGINE SPECIFICATION SHEET

Item	Kid ROK	Mini ROK
Spark plug cap	W420/2 (ROK) or TB05EM (NGK)	W420/2 (ROK) or TB05EM (NGK)
Spark plug	NGK B9EG or B10EG	NGK B10EG
Squish	2.65mm Min measured with 3.15mm resin core solder	0.8mm Min measured with 1.6 mm resin core solder
Cylinder head shape and volume	9.6 cc Min, and ROK profile gauge	6.8 cc Min, and ROK profile gauge

Head Spacer Thickness	2.0mm ± 0.1	As required to achieve volume
Head Spacer OD	62.1 62.2mm +/- 0.1	NA
Head Spacer ID	41.7 42.0mm +/- 0.1	NA
Shims	As required	As required
Port durations (measured with 5mm wide ROK feeler gauge)	Exhaust 154° Max Transfer 116° ± 1.5° Inlet 143° ± 1.5° Overlap 31° Min	Exhaust 154° Max Transfer 116° ± 1.5° Inlet 143° ± 1.5° Overlap 31° Min
Ignition timing	Free	Free
Exhaust manifold	As per Mini ROK specification with a 16mm exhaust restrictor. NO GO specification: 16.10mm. Exhaust manifold needs to be sealed to the engine.	As per Mini ROK specification
Carburetor	Dellorto PHBG 18BS	Dellorto PHBG 18BS
Main jet	Free	Free
Emulsion tube	Dellorto AN266	Dellorto AN266
Needle	Dellorto W23	Dellorto W23
Needle clip position	Free	Free
Needle and seat	As per current Mini ROK carburetor specification	As per current Mini ROK carburetor specification
Choke jet	Dellorto 60	Dellorto 60
Pilot jet (idle jet)	Dellorto 50	Dellorto 50
Slide	Dellorto 40	Dellorto 40
Floats	Dellorto 4.0 grams	Dellorto 4.0 grams
Sprockets rear	Free	Free
Engine sprocket	T10 with Vortex Logo	T10 or T11 with Vortex Logo
All other specifications	As per current Mini ROK FIA homologation form	As per current Mini ROK FIA homologation form

SECTION D – OKJ & OK-N

18. TYRES

- a. One set of new Slick tyres to be used from timed qualifying practice until the last and final race of the competition.
- b. In the case of the race being declared a wet race the competitor is entitled to used 1 set of Wet tyres that has been scanned by the Organizers. Tyres may be used or new.

19. OKJ & OK-N ENGINES

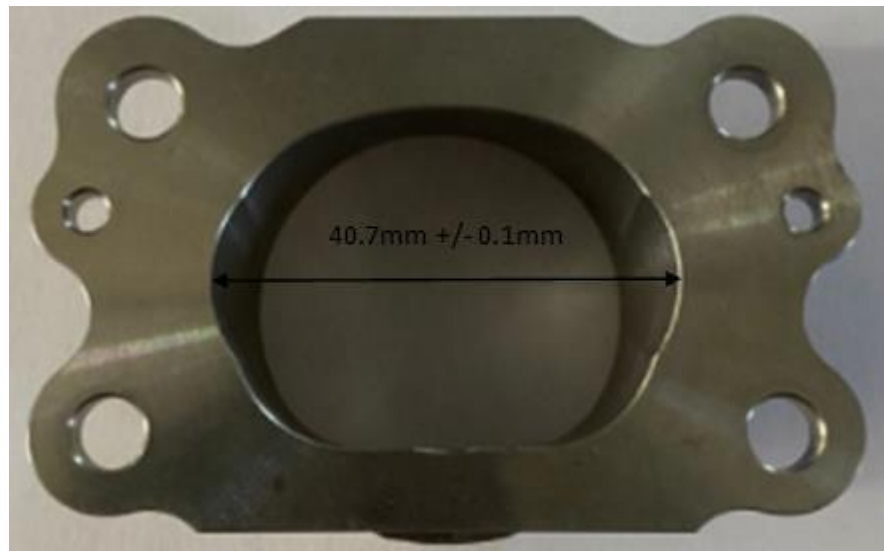
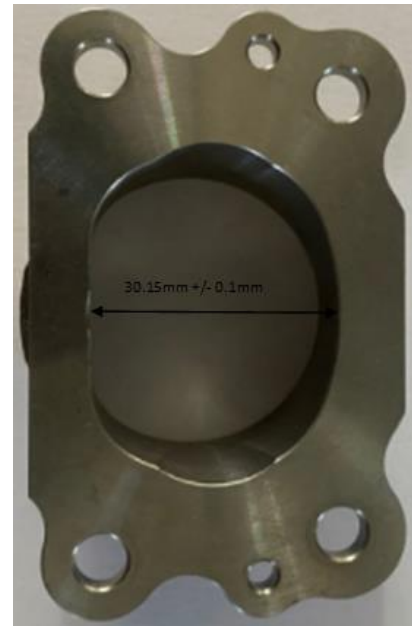
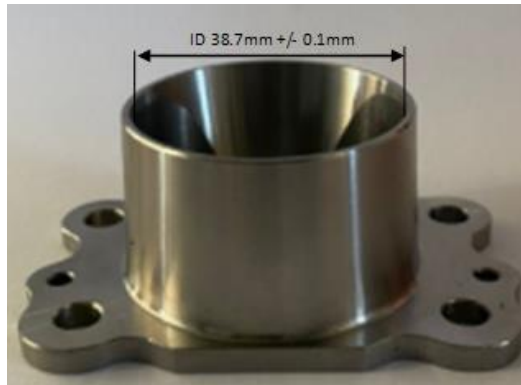
- a. A pool engine system will be put in place for National Championship events. Pool engines are non protestable at National Championship events. Competitors not satisfied with their engine may request a different engine in consultation with the TC, designated engine supplier and the Clerk of Course. This request may only be made once per racing season. A bulletin will be issued on costs of engine rentals. **If a competitor is found at any time during an event to have tampered with the pool engine or any of its components issued to him/her, they will be**

excluded from the entire event and fined an amount of R10 000.00.

- b.** When engines are swapped, this will include engine, exhaust, carburetor, air box and throttle inner cable.
- c.** For National competitions the only engine permitted will be as supplied from FTW's approved engine service provider as from official practice that is pre-sealed by the engine service provider.
- d.** No type or form of modifications/adjustments is allowed to the engine or any other parts which include the fuel supply, carburetor, ignition etc.
- e.** No break is allowed in the fuel line between the tank to the fuel pump and pump to the carburetor other than for the fitting of a fuel filter.
- f.** No exhaust or cylinder temperature measuring devices are allowed to be used during competition. A water temperature sensor is compulsory during National/Regional competitions.
- g.** During National Championship events, competitors may be requested to swap engines from start of official practice. Competitors will generally use a minimum of two (2) pool engines during a race weekend. It must be noted that the amount of engine swaps/changes for an event is not limited to two (2) and might be more at sole discretion of the controllers. The order in which the engine swap/s takes place will be completely random and is determined and published before start of timed practice.
- h.** Inlet Manifold: The only inlet manifold permitted is as per photos below. No material may be added or removed.



- i. Exhaust Manifold: The only exhaust manifold permitted is as per photos and dimensions below. No material may be added or removed. The Exhaust Manifold gasket as supplied must be fitted at all times.



Item	OKJ	OK-N
Airbox	KG Nitro airbox.	KG Nitro airbox.
Spark plug cap	W420/2 (ROK) or TB05EM (NGK)	W420/2 (ROK)
Spark plugs	NGK B9EG or NGK B10EG	NGK B9EG or NGK B10EG
Squish	0.85mm Min measured with 1.6mm resin core solder	0.72 0.75mm Min measured with 1.6mm resin core solder
Cc's cylinder head only	14.0cc Min	12.0cc Min
Head gasket	As required	As required
Shims	As required	As required
Exhaust port	171° Max measured with 5mm	194° Max measured with 5mm
duration	wide ROK feeler gauge	wide ROK feeler gauge

All ports and passages	All ports and passages have a cast surface finish. The only exception allowed will be the removal (by the manufacturer) of aluminum cast burr/s at the inlet, exhaust and transfer ports and passages next to the cast iron sleeve to a maximum depth of 15mm. It must be noted that any additional machining not provided for above is strictly prohibited	All ports and passages have a cast surface finish. The only exception allowed will be the removal (by the manufacturer) of aluminum cast burr/s at the inlet, exhaust and transfer ports and passages next to the cast iron sleeve to a maximum depth of 15mm. It must be noted that any additional machining not provided for above is strictly prohibited
Inlet system	As per FIA Karting Specification	As per FIA Karting Specification
Ignition timing	Free	Free
Ram Tubes for airbox	Must have 2 and have a maximum internal diameter of 23mm	Must have 2 and have a maximum internal diameter of 23mm
Max RPM	14000	15000
Exhaust manifold	As per FIA Karting Specification	As per FIA Karting Specification
Carburetor	Dellorto VHST24BS	Tillotson HW-49A
Main jet holder	Dellorto 18.0 ± 0.1	N/A
Emulsion tube	Dellorto AQ270 - 2.70mm ± 0.2	N/A
Needle	Dellorto D55	N/A
Needle clip posit.	Free	N/A
Needle and seat	Dellorto 270. NO GO 2.71mm	Pressure adjustable. As per FIA Karting homologation form.
Choke jet	Dellorto 60 - GO 0.60mm / NO GO 0.62mm	N/A
Pilot jet (idle jet)	Dellorto U43. Through holes GO 0.42mm / NO GO 0.44mm. Jet size GO 0.98mm / NO GO 1.01mm	N/A
Slide	Dellorto 50	N/A
Floats	Dellorto 4.0 grams	N/A
Sprockets rear	Free	Free
Engine sprocket	T12	T12
All other specifications	As per FIA Karting Homologation Form	As per FIA Karting Homologation Form

19.2 OK-N Engine

- j. For all competitions competitors will use a FIA Karting specified VTS-N VORTEX engine which must be sealed by the Engine Builder, Technical Consultant and/or Scrutineer. ALL competitors need to ensure that the cylinder head and cylinder have cross-drilled nuts/bolts to facilitate the fitting of wire seals. Seals need to have a barcode and number.

Note: It is the responsibility of the competitor to ensure that the Engine Builder, Technical

Consultant/Scrutineer has sealed his/her engine/s before taking part in qualifying/race/s.

- k. No type or form of modifications/adjustments are allowed to the engine or any other parts except those detailed in the engine specification sheet. This includes the fuel supply, carburetor, ignition, etc.
- l. No break allowed in fuel line between tank to fuel pump and pump to carburetor other than for the fitting of a fuel filter.
- m. No exhaust or cylinder temperature measuring devices or lambda sensors are allowed to be used during qualifying/races. To clarify, these devices and/or sensor must be completely removed and the exhaust must be used as supplied by the engine importer.

SECTION F – CADET

20. SPECIFICATIONS

- a. The Tillitson T-CHS-BB1 chassis is the only permitted kart.
- b. The Tillitson TPP-105R engine is the only permitted engine.
- c. It is to be raced as supplied without expensive accessories or replacement parts.
- d. A rev-counter / lap timer is permitted. No additional sensors (CHT, throttle position etc.) are allowed during the event.
- e. Maximum rear width is controlled by the mounting face of the rear hub not extended past the axle end point.
- f. No modifications are permitted, and any variations must be approved **in writing** by the MSA Karting Management Group prior to the modification being made.

SECTION G – KZ2

21. TYRES

Supply and Fitting:

- a. New tyres can be purchased and fitted to rims on the Friday of the race weekend but must be scanned.
- b. New tyres maybe utilised for each SA National and Regional for Qualifying and race day heats for these events.

KZ2 Shifter Class:

- a. LeVanto KRT dry (one new set per race day).
- b. Bridgestone YNP wet (only one set allowed for the days racing).

Tyre monitoring:

Each barcoded set of tyres will be scanned and allocated to each competitor to ensure that the same set is used for the Official Qualifying and all three races on the day.

Tyres may be rotated on the rims between races.

22. CHASSIS

The chassis must comply with the following regulations:

- a. Rear protection, bodyworks, front panel and spoiler – FIA Karting homologated only.
- b. Rear and front homologated brakes of the same type acting on both front and rear wheels KZ type foot.
- c. Two or three rear axle ball bearings to be operational at all times (no ceramic type ball bearings permitted).
- d. Ceramic type disc rotors are not permitted.
- e. One chassis per driver.
- f. Any chassis damaged during an ascertained accident will be reported to the technical consultant/ scrutineer who will consult with the relevant officials in deciding if the chassis warrants replacement or not. Only they may authorize the replacement.
- g. Any decision to allow the use of an alternative chassis will render the use of the original chassis void.
- h. Chassis must also comply with: Conventional chassis, under FIA Karting current homologation.
- i. Hollow magnetic steel rear axle, maximum diameter 50mm.
- j. The regulations prescribed by FIA Karting (Group 2) are strictly applicable for any detail not mentioned in the paragraph concerning the CHASSIS (as per article 2 of the present regulations). Only chassis homologated for use in S.A. may be used.

23. FIA KZ2 ENGINE

Specific Regulations for KZ2

- a. Water cooled single-cylinder engine with reed-valve intake homologated by the FIA Karting.
- b. Maximum cylinder cubic capacity: 125cc.
- c. Reed-valve box (dimensions and drawing) according to the Homologation Form. Reed-valve box cover is free.
- d. Float chamber carburetor made of aluminum, with a venturi type diffuser with a maximum diameter of 30mm.
- e. The carburetor must remain strictly original. The only settings allowed may be made to: the slide, the needle, the floaters, the float chamber, the needle shaft (spray), the jets and the needle kit, subject to all the interchanged parts being of Dell'Orto origin. The incorporated petrol filter and the plate (part No. 28 on the technical drawing No. 7 appended) may be removed, but if they are kept, they must be original.
- f. Gearbox: homologated by the FIA Karting (including the primary torque). With a minimum of three (3) ratios and a maximum six (6) ratios allowed. Check of the ratios using a graduated disc with a minimum diameter of 200mm or a digital coder; the degree decimals given on the Homologation Form must be mentioned in tenths of degrees and not in minutes. For the homologation of the gearbox, the Manufacturer(s) and the model and type must appear on the Homologation Form.
- g. In KZ2, a hand-operated and exclusively mechanical gearbox control without a servo system must be used. Any system of ignition cutting is forbidden.

- h. Total exhaust opening angle of 199° maximum, irrespective of the value indicated on the homologation form (to be read with a graduated circle of a minimum diameter of 200mm or with a digital device).
- i. Volume of the combustion chamber is 11cc minimum, measured in accordance with the method described in Appendix No. 1a.
- j. Spark plug is a free make (mass-produced and strictly original). The body of the spark plug (electrodes not included), tightened on the cylinder head and must not extend beyond the upper part of the dome of the combustion chamber.
- k. Dimensions of the threaded spark-plug housing: length 18.5 mm; pitch: M 14 x 1.25.
- l. Identifications: Machined flat spaces of 30mm x 20mm for the attachment of the specified identification stickers at two locations viz. the front of the cylinder, and the upper part of the reed box housing for the half sumps.
- m. It is allowed to add a mass to the ignition rotor; it shall be fixed by at least 2 screws, without any modification to the homologated rotor.
- n. Exhaust: Homologated and the magnetic steel sheet metal thickness of which must be 0.75mm minimum.
- o. Exhaust silencer: Homologated, and mandatory for use. Fitting of the exhaust and silencer according to the Technical Drawing No. 20.

24. ENGINES PERMITTED

TM KZ10 Homologation Form No. 49/M/18 VERSION 1.3 – 13/12/2012

TM KZ10C Homologation Form No. 32/M/24 VERSION 1.2 – 22/09/2016

TM KZ-R1 Homologation Form No. 041-EZ-75 VERSION – 09/2020

VORTEX RSZ Homologation Form No. 012-EZ-76 VERSION 1 - 15/02/2019

- a. All models to be raced complete with carburetor, exhaust and ignition as supplied by the manufacturer and specified on the motor's homologation form and must comply with the FIA Karting Technical Regulations for KZ2 Engine Specifications.
- b. Only original TM components may be used as per TM spare parts lists of each Homologated TM engine.
- c. Only original Vortex components may be used as per the Vortex spare parts list of the Homologated Vortex engine.
- d. No modifications of these engines or any components including the exhaust and carburetor are permitted unless specifically noted. Any modification or adjunction on these engines and its accessories, if not expressly authorized in these regulations, is forbidden. Drivers are responsible for the conformity of their equipment.
- e. All engines will be sealed after qualifying and will remain sealed for the entire race day. The seal is to be secured between the cylinder head bolt and the reed cover manifold and to be made as tight as possible. Should there be a technical reason for breaking the seal, the kart must be taken to Parc Ferme and in consultation with the Scrutineer carry out the breaking of the seal and necessary repair. The engine will then be resealed. Failure to follow procedure will result in exclusion on race day.

- f. Should a motor be replaced then the damaged motor is to remain in the care of the Scrutineers until they say it may be handed back.

Please note that the FIA homologation sheets and homologated parts catalogue been used for the engine rules are available on the MSA website. The full FIA Karting regulations can be found on: <https://www.fiakarting.com/>

25. ENGINE TECHNICAL DESCRIPTION

Cylinder cubic capacity

V is the volume engendered in the engine cylinder(s) by the upward or downward movement of the piston(s). This volume is expressed in cubic centimeters and, for all calculations concerning engine capacity, the number "pi" will be taken inclusively as 3.1416.

$V = 0.7854 \times d^2 \times l \times n$ with: d = bore; l = stroke; n = number of cylinders.

a. Ducts or passages

Ducts or passages are cylindrical or cylindrical-conical elements allowing the passage of gases whatever the length or position of these elements. The number of ducts or passages is the greatest quantity of cylindrical or cylindrical-conical elements which transmit gases from the pump casing to the top of the piston, as well as those which transmit gases from the outside of the cylinder to the inlet ports, or from the exhaust ports to the outside of the cylinder.

b. Inlet or exhaust port

A port is composed of the intersection of the periphery of the cylinder and the inlet or exhaust duct. This port is opened or shut by the passage of the piston.

c. Power valve

By « power valve » is meant any system which can alter by manual, electric, hydraulic or any other means the normal exhaust port timing or the normal flow of exhaust gases at any point between the piston and the final exhaust exit when the engine is running.

26. GENERAL

By engine is meant the propelling unit of the vehicle in running order, including a cylinder block, sump and gearbox, ignition system, carburetor(s) and exhaust silencer.

All systems of injection are forbidden. The spraying of products other than fuel is forbidden. The engine shall not comprise a compressor or any super-charging system.

Any modifications inside the engine may only be carried out by the removal of material. KZ2 engines must be described in the Manufacturer's catalogue and be the subject of a descriptive form called "Homologation Form" from the model established by the FIA Karting.

a. Cylinders

For UN sleeved engines, repairing cylinders is allowed by addition of material but not of parts.

Cylinder head: it is allowed to replace the spark plug thread by a Heli-coil, must remain within factory specs.

b. Water cooling

Only water (H₂O) is authorized for liquid cooling. No glycol-based antifreeze is allowed to be used.

For all categories using water cooling, radiators must be placed above the chassis frame, at a maximum height of 50cm from the ground, at a maximum distance of 55cm ahead of the rear wheels axle and they must not interfere with the seat. All the tubing must be of a material designed to withstand the heat (150°C) and pressure (10bar). To control the temperature, it

is only allowed to place at the front or at the rear of the radiator a system of masks. This device may be mobile (adjustable), but it must not be detachable when the kart is in motion, and it must not comprise dangerous elements. Mechanical by-pass (thermostat type) systems, including by-pass lines, are allowed. In line heat exchangers are allowed in the water pipes.

c. Water pump

The water pump must be mechanically controlled either by the engine or by the rear axle.

d. Carburetors and inlet duct

Any injection system is forbidden. Any spraying of products other than fuel is forbidden. The inlet duct (mechanical assembly between the homologated inlet silencer and the reed box) must comprise the inlet silencer, the carburetor and the reed box cover, as well as a possible adaptor, spacer and/or gaskets. No additional component is authorized.

The adaptor (spacer) must have a transversal conical cylinder cross-section, be mechanically attached with tools and present neither any connections fitting together nor parts which overlap each other. Furthermore, it is forbidden to have any connection resulting in an extra volume (including any groove, hollow space or other such spaces) at the level of the inlet duct. Carburetors in the KZ2 category for the FIA Karting Championships in 2019/2020/2021: technical drawing No. 7 appended. Inline heat exchangers and carburetor tanks are permitted in the fuel line.

e. Ignition

In all categories the ignition system used must be homologated by the FIA Karting. For the KZ2 the ignition system used must be (as per the engines Homologation Form) of analogue type and any variable ignition system (system of progressive advance and delay) is forbidden.

Any electronic system allowing an auto-control of the parameters of functioning of the engine while the kart is in motion is forbidden.

Competitors in consultation with the TC and Clerk of the Course must request to interchange Entrants' ignition systems for the system supplied by the FIA Karting or the ASN concerned (same homologated models).

f. Spark plug

The ignition spark plug must be mass-produced and remain strictly original. The spark plug barrel and the electrode insulation (electrodes not included) tightened on the cylinder head must not extend beyond the upper part of the combustion chamber dome (see Appendix No. 7).

The spark plug must be installed with its gasket.

A spark plug temperature probe is permitted and if it is min 1.2mm thick, after being fitted and/or used it can act as a spark plug gasket. The insulator must not exceed the spark plug body and the length of the spark plug body itself must be a max 18.5mm

g. Inlet Silencer (Air Box)

An inlet silencer homologated by the FIA Karting is mandatory.

KZ2: ducts of 30mm maximum.

Variable volume air boxes are forbidden.

The obligatory homologated intake silencer must be used under strict observance of the following points:

If the rubber bush is reversible, it may only be cut on one side, the unused one located in the body of the silencer.

The part of the bush linking the silencer to the carburetor must be visible at all times and must be on the outside of the silencer. It allows the rear face of the silencer to be connected to the cylindrical shoulder of the carburetor.

h. Exhaust

In KZ2 the exhaust must be Engine Specifically homologated. In all categories the exhaust system shall discharge behind the Driver and shall not operate at a height of more than 45cm from the ground. The exhaust silencer outlet, the external diameter of which must be more than 3cm, must not exceed the limits of the body or bumper. All systems of « power valve » are forbidden.

Competitors in consultation with the TC and Clerk of Course may be authorized to interchange Entrants' exhaust systems for the system supplied by the FIA Karting or the ASN concerned (same homologated models).

i. Silencer

The Exhaust Silencer must be FIA Homologated. See FIA Exhaust Silencer Homologation List.

27. FUEL – COMBUSTIVE

a. Fuel

The requirements specified in these regulations are intended to ensure the use of fuels predominantly composed of compounds normally found in commercial fuel, and to prohibit the use of specific power-boosting chemical compounds. All competitors will only be permitted to use freely and commercially available 95 octane pump fuel.

b. Mixture used in 2-stroke engines.

The only oil that may be used is ENI Engine oil for KZ2 and the Oil/Fuel mix must be 4% (25:1) class will use oil as prescribed by the National Promoters in the event SR's. Modification of the basic fuel composition by the addition of any compound is strictly forbidden. This restriction also applies to the lubricant, which must not change the composition of the fuel fraction when added to the fuel. Furthermore, as for the fuel, the lubricant must not contain any nitro-compounds, peroxides or any other engine power boosting additives. Fuel testing **will may be carried out at events. the norm in the Nationals and a base needs to be set.**

c. Air

Only ambient air may be mixed with the fuel as a combustive.

28. CONTROLS

For control, the following tolerances are allowed

Connecting rod center line: $\pm 0.2\text{mm}$

Piston stroke: $\pm 0.2\text{mm}$

Crankshaft alone: $\pm 0.1\text{mm}$

Homologated gearbox: Value obtained after 3 engine rotations: $\pm 3^\circ$

Exhausts of all 125cc engines: $\pm 1\text{mm}$

Piston, crankshaft & conrod, reed box, balance shaft

Dimensions: $<25\text{mm}$ - Tolerance: $\pm 0.5\text{mm}$

Dimensions: $25-60\text{mm}$ - Tolerance: $\pm 0.8\text{mm}$

Dimensions: $60-100\text{mm}$ - Tolerance: $\pm 1\text{mm}$

Dimensions: $>100\text{mm}$ - Tolerance: $\pm 1.5\text{mm}$

Machined Parts:

Dimensions: <25mm - Tolerance: $\pm 0.5\text{mm}$

Dimensions: 25-60mm - Tolerance: $\pm 0.8\text{mm}$

Dimensions: >60mm - Tolerance: $\pm 1.5\text{mm}$

Welded parts

Dimensions: <25mm - Tolerance: $\pm 1.0\text{mm}$

Dimensions: 25-60mm - Tolerance: $\pm 1.5\text{mm}$

Dimensions: >60mm - Tolerance: $\pm 3.0\text{mm}$

The units of measure (including derived units) will be those of the international system: unit of length in meters, unit of mass in kg, unit of time in s, and unit of noise level in decibels. However, the following will be used: for the unit of angle, the $^{\circ}$ (degree) instead of the radian; and, for the unit of temperature, the $^{\circ}\text{C}$ instead of the Kelvin.

Without tolerance, at all times and whatever the conditions may be Cubic capacities.

Diameter of the carburetor venturi. (30.0mm Max).

Mass measurement.

Combustion chamber volume. (11cc Min)

Any minimum and maximum value.

29. CHECKS TO BE DONE BY APPOINTED TECHNICAL CONSULTANT

Method for measuring the opening angles of the exhaust ports

All motors: Exhaust 199 degrees Max. In order to make the measurement more accurate, a 0.20mm thick x 5mm wide wedge (according to technical drawing No. 18) will be used to establish the start and finish of the measurement. This wedge will be gripped at the chord axis of each port, between the edge of the upper part of the piston ring or of the piston and its intersection with the edge of the inlet or exhaust port. The position by which the gripping of the wedge will permit the measurement of the largest possible angle will be considered as the beginning and the end of the measurement of the angle.

This wedge may be set in position through the inside of the cylinder or through the duct of the exhaust port to be checked. It will not be mandatory on any account for the wedge to be placed in a horizontal or vertical position. The reading will be carried out using a graduated disc with a minimum diameter of 200mm or a digital display measuring device operated by a coder.

Volume test for combustion chamber

[Appendix No. 1](#) On KZ2 Engines, the volume then measured minus the plug insert (2cc) must not be less than 11cc using the plug insert as per [Drawing no. 6](#).

General method for measuring the volume of the combustion chamber

Remove the engine from the chassis. Wait until the engine is at ambient temperature. Have the cylinder head removed to check the protrusion of the spark plug. Have the spark plug removed (check the 18.5mm dimension). Screw the plug insert in place of the spark plug (the plug insert, tightened on the cylinder head, must not extend beyond the upper part of the dome of the combustion chamber. It must be fixed to the cylinder in exactly the same way as the spark plug measuring 18.5mm long).

Make the top part of the piston and the periphery of the cylinder waterproof using grease. Place the piston at top dead center and block the crankshaft. Carefully remove the excess grease. Place the cylinder head back and screw it in at the torque recommended by the

Manufacturer.

With a laboratory graduated burette (mechanical or electronic), fill the combustion chamber (with DEXTRON VI type oil) to the uppermost part of the top edge of the plug insert (wetting the plane of the head gasket).

Alternative method for measuring the volume of the combustion chamber

Remove the engine from the chassis. Wait until the engine is at ambient temperature. Have the spark plug removed (check the 18.5mm dimension). Screw in the plug insert in place of the spark plug (the plug insert, tightened on the cylinder head, must not extend beyond the upper part of the dome of the combustion chamber. It must be fixed to the cylinder in exactly the same way as the spark plug measuring 18.5mm long). Place the piston at top dead center and block the crankshaft. With a laboratory graduated burette (mechanical or electronic), fill the combustion chamber (with DEXTRON VI type oil) to the uppermost part of the top edge of the plug insert (wetting the plane of the head gasket). In case of discrepancy of the measured value, the complete procedure must be carried out according to the "General Method" of [Appendix No. 1](#).

Squish test and procedure

This can be used as an alternative for volume test on race day between races. A minimum squish of 1mm is permitted and measurement will be done with a digital Vernier at the smallest point of the wire up against the shoulder created by the piston. The Vernier will be owned by the club and will be present on race days for any competitor to check squish prior to the sealing of the motor. The solder wire to be 1.6mm Solid Wire. The solder wire will have a tolerance off ± 0.1 mm. The squish will be checked on both the left and the right side of the piston parallel to the gudgeon pin, and the smaller of the two measurements will be the measurement used for legality.

Remove the spark plug. Insert solder to touch cylinder wall directly above the gudgeon pin. With the solder wire in place the motor will be turned through top dead center once. The step on the solder will not be cut off. The smallest point on the solder against the shoulder measured with the point of the Vernier will be the final measurement. ([Appendix B and C](#)).

30. ENGINES

KZ2 FIA specified.

Only reed-valve intakes are authorized. The original parts of the homologated engine must always comply with and be as per the photographs, drawings, materials and physical dimensions described on the Homologation Form.

Modifications to the homologated engine that are allowed.

Reed manifold can be modified e.g. polishing, grinding, sand blasting. Strictly no material may be added. A maximum of 31.5mm throat diameter is permitted. Crankcase may be cleaned and polished and sand blasted. Strictly no material may be added. As per homologation sheet and only original TM Racing parts as per the homologated motors to be used. Crankshaft may only be statically balanced. Standard conrods as per homologated spares list may be polished but not lightened. Carburetors can be polished but the venturi must be a maximum of 30mm and the profile has to remain as per the original Dell'Orto VHS 30 CS profile. External water flow U-tube from the barrel to crankcase can be removed and sealed due to seat positioning for the taller or larger competitor.

Modifications to the homologated engine that are NOT allowed inside e the engine.

The stroke, the bore (outside the maximum limits), the connecting rod centerline, the number

of transfer ducts and inlet ports in the cylinder and crankcase, the number of exhaust ports and ducts. The crankshaft may not be DYNAMICALLY BALANCED (grinding or removal of material is prohibited). The Reed Valve must be as supplied with strictly no machining permitted. Other restrictions according to the specific regulations.

Outside the engine

Number of carburetors and diameter of choke, all the clutch components must be original as per motors Homologation Form without any modifications.

External appearance of the fitted engine

The following are not considered to be modifications to the external appearance of the engine:

Modification of the colour of the parts, the trimming of cooling connections and modification of the fixations (including but not limited to fixations of the carburetor, of the ignition, of the exhaust, of the clutch or of the engine itself), provided that their homologated position is not modified.

31. GEAR SHIFT

- a. Only hand operated gear shift is allowed.
- b. Paddle shift with a push pull cable is permitted.
- c. An Electronic paddle shift is permitted.
- d. Any form of Ignition cutting is strictly forbidden.

32. REAR AXLES

- a. It is permitted to have rear axle insert so as to strengthen the keyway area where the axle sprocket is located.
- b. The maximum rear axle width from outside rim to outside rim is 1400mm (not tyres).

33. AIR BOX MODIFICATION

- a. Only FIA Karting homologated air boxes must be fitted.
- b. In the event of rain to protect the motor from water damage a protective device may be fitted. This device must be securely fitted. Duct tape is permitted to help secure the device.

34. DOCUMENTATION SPEC SHEETS

Available for download on <https://www.motorsport.co.za>